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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Robert Miller
Serial No.: 09/732,189
Filed: December 7, 2000
For: PEER PROTOCOL STATUS QUERY IN CLUSTERED COMPUTER SYSTEM

Art Unit: 2157
Examiner: Hussein A. El-chanti
Atty. Docket No.: IBM/151

RESPONSE

Mail Stop AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

This paper is submitted in reply to the Office Action dated March 15, 2004, within the three-month period for response. Reconsideration and allowance of all pending claims are respectfully requested.

In the subject Office Action, claims 1-26 were rejected under 35 U.S.C. § 102(e) as being anticipated by U.S. Patent No. 6,392,993 to Hamilton et al. Applicant respectfully traverses the Examiner's rejections to the extent that they are maintained.

Turning first to the rejection of independent claim 1, this claim generally recites a method of determining a status of a peer protocol initiated on a plurality of members of a group in a clustered computer system. The method includes locally tracking protocol progress information within each member of the group, and responding to a query directed to a selected member of the group by providing the protocol progress information locally tracked by the selected member.

Hamilton, on the other hand, lacks a number of features recited in claim 1, and therefore falls short of anticipating the claim. In particular, claim 1 recites a method of

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determining the status of a "peer protocol" initiated on a plurality of members of a group in a "clustered computer system." Hamilton, on the other hand is completely silent with respect to clustering or to peer protocols. Furthermore, given that these limitations in the preamble serve to define terms used elsewhere in the claim, these limitations are properly subject to patentable weight.

In addition, claim 1 recites the concept of locally tracking the "protocol progress information" within "each member of the group." Put another way, every member of the recited group is responsible for locally tracking the progress of the peer protocol.

Hamilton, on the other hand, discloses a multicasting messaging protocol that, in one embodiment, utilizes a positive reliability mode whereby recipients of a multicast message send acknowledgments back to a sending system. Columns 3 and 4 of the reference, which have been cited by the Examiner, merely disclose that a sending system is capable of tracking acknowledgments received from the recipient systems to which a packet has been sent. This disclosure, however, is deficient in several regards.

First, tracking the receipt of acknowledgments to a packet falls short of "locally tracking protocol progress information." As described, for example, at page 2 of the application, a "protocol" in the context of a clustered computer system refers to the performance of operations to be performed by the members of a group in a cluster. Lines 13-20, in particular, describe how peer-type protocols are handled by multiple members using ordered message-based communications. Members are prohibited from proceeding on with other work until acknowledgments from all members for a particular requested protocol have been received. The simple transmission of a multicast packet is not analogous to a "protocol," and as such, tracking acknowledgments to a multicasting packet is not analogous to tracking the progress of a protocol.

Second, claim 1 recites that the local tracking of protocol progress information is performed by each member of the group. The passages cited by the Examiner in Hamilton, however, merely disclose a single system (the sending system) that arguably

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tracks the receipt of acknowledgments from recipient systems. There is nothing in the cited passages that discloses or even suggests that the recipient systems locally track progress information related to the acknowledgments sent by other recipient systems. Put another way, Hamilton does not disclose multiple systems, much less each system, tracking acknowledgments.

Claim 1 additionally recites the concept of responding to a query directed to a selected member of a group by providing the protocol progress information locally tracked by that selected member. Here, the Examiner again cites column 4 of Hamilton, and in particular, lines 9-17. The cited passage, however, is completely silent with respect to a query that is responded to by providing protocol progress information. The cited passage instead discusses reply messages, which are sent whenever a particular request that has been sent out demands a response, which is above and beyond an acknowledgment. However, the replies described in this passage are not analogous to queries within the context of claim 1. One aspect of the invention recited in claim 1 is that a query can be sent to a member of a cluster group to request that the progress information being tracked by that member be output as a response to the query. There is nothing in Hamilton, on the other hand, that discloses or suggests that the acknowledgments that are tracked in a sending system of Hamilton are ever provided in response to a particular query directed to the sending system.

Accordingly, Applicant respectfully submits that Hamilton fails to disclose each and every feature recited in claim 1. Claim 1 is thus novel over Hamilton.

Applicant also respectfully submits that claim 1 is non-obvious over Hamilton, as there is no suggestion in Hamilton or elsewhere in the prior art to modify the multicasting protocol of Hamilton to be used in a clustered computer environment, nor to provide the ability to both locally track the progress of a peer protocol or respond to a query directed to a particular member that results in the output of the tracked information. Accordingly, Applicant also respectfully submits that claim 1 is non-obvious over Hamilton and the

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other prior art of record. Reconsideration and allowance of claim 1, as well as of claims 2-13 which depend therefrom, are therefore respectfully requested.

Next, with respect to independent claims 14, 22, and 23, as with claim 1, each of these claims recites the concept of tracking the status of a peer protocol initiated on a plurality of members of a group in clustered computer system. Furthermore, each of these claims likewise recites the provision of tracked protocol progress information in response to a query directed to a member of the group. As discussed above in connection with claim 1, Hamilton neither discloses nor suggests either the tracking of the progress of a peer protocol initiated on a plurality of members of a group in a clustered computer system, or the provision of tracked protocol progress information in response to a specific query directed to one of the members. Accordingly, Applicant respectfully submits that independent claims 14, 22, and 23, as well as claims 15-21 and 24 which depend therefrom, are novel and non-obvious over Hamilton and the other prior art of record. Reconsideration and allowance of these claims are therefore respectfully requested.

Next, with respect to independent claim 25, this claim recites an apparatus that includes a memory, and a program that monitors for a receipt of a query message by a member of a group in a clustered computer system while a current protocol for the member is waiting on a resource. The recited program also outputs protocol status information in response to receipt of the query message.

In rejecting claim 25, the Examiner relies on columns 3 and 4 of Hamilton. Hamilton, however, is deficient in a number of respects. First, as discussed above with respect to the preceding claims, Hamilton is not directed to a clustered computer system, and thus fails to disclose or suggest the concept of protocols, groups, members, or clustering. In addition, the cited passages are entirely silent with respect to the concept of waiting on a resource, much less monitoring for receipt of a query message while a current protocol is waiting on the resource.

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Hamilton also fails to disclose the outputting of protocol status information in response to receipt of a query. From Applicant's reading of the reference, it appears that, while acknowledgments to particular packets are tracked, there is no mechanism by which such tracking information is ever output by a sending system. Put another way, it appears the Hamilton tracking is a purely internal mechanism.

In contrast, embodiments consistent with the invention recited in claim 25 may be used, for example, to assist in identifying slow or stuck members in a cluster that may be degrading the overall performance of other members. As discussed, for example, at page 13, lines 18-29, embodiments consistent with the invention recited in claim 25 are able to respond to status queries even when waiting on resources. Furthermore, through the local tracking of protocol progress, the identification of a slow or stuck member does not require accessing that stuck or slow member, and as a result, may assist in diagnosing problems in a much quicker and more efficient manner than would otherwise be required.

Hamilton appreciates none of these features, and as such, fails to anticipate claim 25. Reconsideration and allowance of claim 25, as well as of claim 26 which depends therefrom, are therefore respectfully requested.

As a final matter, while Applicant traverses the rejections of the dependent claims based upon the dependency of these claims on their respective independent claims, Applicant wishes to address a number of the dependent claims that recite additional features not disclosed or suggested by Hamilton.

Claims 3, 4, and 16, for example, recite the concept of acknowledgment rounds that track the last acknowledgments received from other members of a group. Hamilton is entirely silent with respect to the concept of acknowledgment rounds, as it appears that the packets sent in Hamilton are not ordered or associated with protocols within the context of the invention.

In addition, claims 6 and 17, similarly to claim 25, recite the concept of waiting on a resource required by a protocol, and monitoring for receipt of the query while

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waiting on the resource. Hamilton is entirely silent with respect to monitoring for receipt of a query for progress information while waiting for a resource required by a protocol.

With respect to claims 7 and 18, these claims recite that the protocol is a peer protocol, which as noted above, is described at page 2 of the application as requiring that all members receive a message, and each member locally determine how to process the message and return an acknowledgment indicating whether the message was successfully processed by that member. The protocol recited in these claims relies on tracking progress locally in each member. Hamilton, in contrast, discloses only the sending of acknowledgments by receiving systems to a single sending system.

With respect to claims 8 and 19, these claims recite that the protocol is a local protocol. Hamilton is entirely silent with respect to the concept of a local protocol.

With respect to claim 9, the claim recites that the local resource is selected from the group consisting of a lock and creation of a new job. The cited passage in Hamilton, at column 27, lines 20-21, is entirely silent with respect to either a lock or a new job.

With respect to claim 10, the claim recites the monitoring of a local message queue for receipt of a query message. As discussed above in connection with claim 25, Hamilton is entirely silent with respect to monitoring for receipt of a query. In addition, Applicant can find no disclosure in Hamilton, and in particular, in the cited passage at column 28, lines 33-49, purporting to disclose the concept of a message queue or of the monitoring of receipt of a query.

Applicant respectfully submits that Hamilton does not disclose the various concepts above in connection with the aforementioned dependent claims. Accordingly, these claims are additionally patentable for the reasons set forth above.

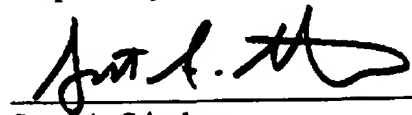
In summary, Applicant respectfully submits that all pending claims are novel and non-obvious over the prior art of record. Reconsideration and allowance of all pending claims are therefore respectfully requested. If the Examiner has any questions regarding the foregoing, or which might otherwise further this case onto allowance, the Examiner

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may contact the undersigned at (513) 241-2324. Moreover, if any other charges or credits are necessary to complete this communication, please apply them to Deposit Account 23-3000.

15 JUNE 2004
Date

Respectfully submitted,



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